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IN THE CLAIMS:

Please amend the claims as follows:

1. (currently amended) A method for producing a quartz glass jig, said method comprising: processing a quartz glass raw material into a desired shape of the quartz glass jig by a treatment including fire working, annealing a product of the desired shape quartz glass jig so as to remove stress therein, and performing a cleaning treatment on the product to obtain a final product, wherein a gas phase etching step and a gas phase purification step are performed on a surface layer of the product quartz glass jig after the annealing but before the cleaning treatment, and wherein the gas phase purification step is carried out continuously after the gas phase etching step.

2. (currently amended) A method for producing a quartz glass jig, said method comprising: processing a quartz glass raw material into a desired shape of the quartz glass jig by a treatment including fire working, annealing a product of the desired shape quartz glass jig so as to remove stress therein, and performing a cleaning treatment on the product to obtain a final product, wherein a gas phase etching step and a gas phase purification step are performed on a surface layer of the product quartz jig after the annealing but before the cleaning treatment, and wherein the gas phase purification step is carried out simultaneously with the gas phase etching step.

3. (currently amended) A method for producing a quartz glass jig, said method comprising: processing a quartz glass raw material into a desired shape of the quartz glass jig by a

treatment including fire working, annealing a product of the desired shape quartz glass jig so as to remove stress therein, and performing a cleaning treatment on the product to obtain a final product, wherein a gas phase etching step and a gas phase purification step are performed on a surface layer of the product quartz glass jig simultaneously with the annealing, and wherein the gas phase purification step is carried out continuously after the gas phase etching step.

4. (currently amended) A method for producing a quartz glass jig, said method comprising: processing a quartz glass raw material into a desired shape of the quartz glass jig by a treatment including fire working, annealing a product of the desired shape quartz glass jig so as to remove stress therein, and performing a cleaning treatment on the product to obtain a final product, wherein a gas phase etching step and a gas phase purification step are performed on a surface layer of the product quartz glass jig simultaneously with the annealing, and wherein the gas phase purification step is carried out simultaneously with the gas phase etching step.

5. (Original) A method for producing a quartz glass jig as claimed in Claim 1, wherein the gas phase etching step is performed in a temperature range of from 0 °C to 1300 °C in a gaseous atmosphere containing fluorine (F).

6. (Original) A method for producing a quartz glass jig as claimed in Claim 5, wherein the gaseous atmosphere containing F contains at least one gas selected from the group consisting of C_xF_y , Cl_xF_y , N_xF_y , Si_xF_y , S_xF_y (where, $10 \geq x \geq 1$ and $10 \geq y \geq 1$), CHF_3 , HF , and F_2 .

7. (Original) A method for producing a quartz glass jig as claimed in Claim 1, wherein the gas phase purification step comprises performing high temperature heat treatment in a temperature range of from 800 to 1300 °C in a gaseous atmosphere containing Cl.

8. (Original) A method for producing a quartz glass jig as claimed in Claim 7, wherein the gaseous atmosphere containing Cl is HCl, Cl₂, or a combination of HCl and Cl₂.

9. (Original) A method for producing a quartz glass jig as claimed in Claim 5, wherein the gaseous atmosphere containing F further includes a gas containing H.

10. (Canceled)

11. (Canceled)

12. (Original) A method for producing a quartz glass jig as claimed in Claim 2, wherein the gas phase etching step is performed in a temperature range of from 0 °C to 1300 °C in a gaseous atmosphere containing fluorine (F).

13. (Original) A method for producing a quartz glass jig as claimed in Claim 12, wherein the gaseous atmosphere containing F contains at least one gas selected from the group consisting of C_xF_y, Cl_xF_y, N_xF_y, Si_xF_y, S_xF_y (where, 10 ≥ x ≥ 1 and 10 ≥ y ≥ 1), CHF₃, HF, and F₂.

14. (Original) A method for producing a quartz glass jig as claimed in Claim 2, wherein the gas phase purification step comprises performing high temperature heat treatment in a temperature range of from 800 to 1300 °C in a gaseous atmosphere containing Cl.
15. (Original) A method for producing a quartz glass jig as claimed in Claim 14, wherein the gaseous atmosphere containing Cl is HCl, Cl₂, or a combination of HCl and Cl₂.
16. (Original) A method for producing a quartz glass jig as claimed in Claim 12, wherein the gaseous atmosphere containing F further includes a gas containing H.
17. (Original) A method for producing a quartz glass jig as claimed in Claim 3, wherein the gas phase etching step is performed in a temperature range of from 0 °C to 1300 °C in a gaseous atmosphere containing fluorine (F).
18. (Original) A method for producing a quartz glass jig as claimed in Claim 17, wherein the gaseous atmosphere containing F contains at least one gas selected from the group consisting of C_xF_y, Cl_xF_y, N_xF_y, Si_xF_y, S_xF_y (where, 10 ≥ x ≥ 1 and 10 ≥ y ≥ 1), CHF₃, HF, and F₂.
19. (Original) A method for producing a quartz glass jig as claimed in Claim 3, wherein the gas phase purification step comprises performing high temperature heat treatment in a temperature range of from 800 to 1300 °C in a gaseous atmosphere containing Cl.

20. (Original) A method for producing a quartz glass jig as claimed in Claim 19, wherein the gaseous atmosphere containing Cl is HCl, Cl₂, or a combination of HCl and Cl₂.

21. (Original) A method for producing a quartz glass jig as claimed in Claim 17, wherein the gaseous atmosphere containing F further includes a gas containing H.

22. (Original) A method for producing a quartz glass jig as claimed in Claim 4, wherein the gas phase etching step is performed in a temperature range of from 0 °C to 1300 °C in a gaseous atmosphere containing fluorine (F).

23. (Original) A method for producing a quartz glass jig as claimed in Claim 22, wherein the gaseous atmosphere containing F contains at least one gas selected from the group consisting of C_xF_y, Cl_xF_y, N_xF_y, Si_xF_y, S_xF_y (where, 10 ≥ x ≥ 1 and 10 ≥ y ≥ 1), CHF₃, HF, and F₂.

24. (Original) A method for producing a quartz glass jig as claimed in Claim 4, wherein the gas phase purification step comprises performing high temperature heat treatment in a temperature range of from 800 to 1300 °C in a gaseous atmosphere containing Cl.

25. (Original) A method for producing a quartz glass jig as claimed in Claim 24, wherein the gaseous atmosphere containing Cl is HCl, Cl₂, or a combination of HCl and Cl₂.

26. (Original) A method for producing a quartz glass jig as claimed in Claim 17, wherein the gaseous atmosphere containing F further includes a gas containing H.